CLAIMS

1. A light-emitter structure comprising:

a platform;

an $In_x(Al_yGa_{1-y})_{1-x}P$ lower clad region formed on said platform and having a lattice constant between approximately 5.49 Å and 5.62 Å;

a strained quantum well active region formed on said lower clad region; and

an $In_x(Al_yGa_{1-y})_{1-x}P$ upper clad region formed on said strained quantum well active region.

2. The light-emitter structure of claim 1, wherein said strained quantum well active region comprises an $In_x(Al_yGa_{1-y})_{1-x}P$ strained quantum-well active region where $0.27 \leq x \leq 0.50$ and $0 \leq y \leq 1$ formed on said lower clad region.

3. The light-emitter structure of claim 1, wherein said upper clad region is approximately lattice-matched to said lower clad region formed on said strained quantum well.

4. The light-emitter structure of claim 1, wherein said platform comprises a $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer placed between a substrate and said lower clad region.

5. The light-emitter structure of claim 4, wherein said substrate comprises GaP.

6. The light-emitter structure of claim 1 further comprising a cap layer that is deposited on said upper clad region.

7. The light-emitter structure of claim 6, wherein said cap layer comprises InGaP that is deposited on and approximately lattice-matched to said upper clad region.

8. The light-emitter structure of claim 1 further comprising separate confinement heterostructures (SCH) placed between said upper clad region, said lower clad region and said strained quantum well active region.

9. The light-emitter structure of claim 8, wherein said separate confinement heterostructures (SCH) comprises InGaP or InAlGaP that is approximately lattice-matched to said clad layer, and placed between said upper clad region, lower clad region and said strained quantum well active region.

10. The light-emitter structure of claim 1, wherein said upper and lower clad regions comprise concentration values x=0.22 and y=0.2.

11. The light-emitter structure of claim 1, wherein said strained quantum well active region comprises concentration values x=0.32 and y=0.

12. The light-emitter structure of claim 1, wherein said lower clad region and upper clad region are n-doped and p-doped, respectively.

13. The light-emitter structure of claim 1, wherein said lower clad region and upper clad region are p-doped and n-doped, respectively.

14. The light-emitter structure of claim 1, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer and said lower clad region are n-doped, and said upper clad is p-doped.

15. The light-emitter structure of claim 1, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer and said lower clad region are p-doped, and said upper clad is n-doped.

16. The light-emitter structure of claim 1, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer is undoped, said lower clad region is n-doped, and said upper clad region is p-doped.

17. The light-emitter structure of claim 1, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer is undoped, said lower clad region is p-doped, and said upper clad region is n-doped.

18. The light-emitter structure of claim 1, wherein said strained quantum well active region is doped.

19. The light-emitter structure of claim 8, wherein said SCH structures are doped.

20. The light-emitter structure of claim 1 further comprising a double top contact.

21. The light-emitter structure of claim 1 further comprising an insulator stripe top contact.

22. A method of forming a light-emitter structure comprising:

providing a platform;

forming an $In_x(Al_yGa_{1-y})_{1-x}P$ lower clad region having a lattice constant between approximately 5.49 Å and 5.62 Å on said platform;

forming a strained quantum well active region on said lower clad region; and

forming an $In_x(Al_yGa_{1-y})_{1-x}P$ upper clad region on said strained quantum well active region.

23. The method of claim 22, wherein said strained quantum well active region comprises an $In_x(Al_yGa_{1-y})_{1-x}P$ strained quantum-well active region where $0.27 \leq x \leq 0.50$ and $0 \leq y \leq 1$ formed on said lower clad region.

24. The method of claim 22, wherein said upper clad region is approximately lattice-matched to said lower clad region formed on said strained quantum well.

25. The method of claim 1, wherein said platform comprises a $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer placed between a substrate and said lower clad region..

26. The method of claim 25, wherein said substrate comprises GaP.

27. The method of claim 22 further comprising depositing a cap layer on said upper clad region.

28. The method of claim 27, said cap layer comprises InGaP that is deposited on and approximately lattice-matched to said upper clad region.

29. The method of claim 22 further comprising placing separate confinement heterostructures (SCH) between said upper clad region, said lower clad region and said strained quantum well active region.

30. The method of claim 29, wherein said separate confinement heterostructures (SCH) comprises InGaP or InAlGaP that is approximately lattice-matched to said clad layer and

placed between said upper clad region, lower clad region and said strained quantum-well active region.

31. The method of claim 22, wherein said upper and lower clad regions comprise of concentration values x=0.22 and y=0.2.

32. The method of claim 22, wherein said strained quantum well active region comprises of concentration values x=0.32 and y=0.

33. The method of claim 22, wherein said lower clad region and upper clad region are n-doped and p-doped, respectively.

34. The method of claim 22, wherein said lower clad region and upper clad region are p-doped and n-doped, respectively.

35. The method of claim 22, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer and said lower clad region are n-doped and said upper clad is p-doped.

36. The method of claim 22, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer and said lower clad region are p-doped and said upper clad is n-doped.

37. The method of claim 22, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer is undoped, said lower clad region is n-doped, and said upper clad region is p-doped.

38. The method of claim 22, wherein said $\nabla_x[In_x(Al_yGa_{1-y})_{1-x}P]$ graded buffer is undoped, said lower clad region is p-doped, and said upper clad region is n-doped.

39. The method of claim 22, wherein said strained quantum well active region is doped.

40. The method of claim 29, wherein said SCH structures are doped.

41. The method of claim 22 further comprising providing a double top contact.

42. The method of claim 22 further comprising providing an insulator stripe top contact.

43. The method of claim 22, wherein said platform comprises a substrate that is lattice-matched to said lower clad region.

44. The light-emitter structure of claim 1, wherein said platform comprises a substrate that is lattice-matched to said lower clad region.